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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/065,562	10/30/2002	Sammy K. Mickelson	LILS 184	7630

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EXAMINER	
LEUNG, JENNIFER A	

ART UNIT	PAPER NUMBER
1764	

DATE MAILED: 11/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/065,562	MICKELSON ET AL.	
	Examiner	Art Unit	
	Jennifer A. Leung	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 October 2002* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☒ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *1/21/03* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Oath/Declaration

1. The oath or declaration is defective because the filing date for priority application number 60/319,491 should be changed to August 25, 2002. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

Drawings

2. FIG. 3 is objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "58" and "60" have both been used to designate the "first edge". A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claims 2-7 and 9-14 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claims, or amend the claims to place the claims in proper dependent form, or rewrite the claims in independent form (i.e., the claims as currently recited depend from an improper and unknown "[Claim Reference]").

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as

the invention. Regarding claim 1, the phrase "or the like" in the preamble renders the claim indefinite because the claim includes elements not actually disclosed (those encompassed by "or the like"), thereby rendering the scope of the claim unascertainable. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 2, 8 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Isenberg (US 5,922,178).

Regarding claims 1 and 8, Isenberg (FIG. 1, 2; generally, column 5, line 66 to column 7, line 45) discloses an apparatus comprising:

- a heat generating furnace for providing a heated environment to an internally mounted oxygen separator (i.e., heater structure **9**, which defines an axial center cavity **11**, for providing heat to electrochemical oxygen separation unit **10**);
- a heat exchanging arm formed from an inner and an outer concentric tube and having an inner and outer passageway separated by a wall of the inner concentric tube (i.e., the heat exchanger-thermal insulation defined by two spirally wound metal sheets/walls **6**, for forming inner and outer passageways **8** having a common axial center; column 6, lines 24-36; see transverse cross-section of FIG. 2);
- the inner concentric tube (i.e., a first passageway **8**) having a first end with a fluid flow outlet (i.e., via peripherally located outlet **5**) and a second end with a fluid flow inlet (i.e.,

via centrally located inlet **9''**);

- the outer concentric tube (i.e., a second passageway **8**) having a first end with a fluid flow inlet (i.e., via peripherally located inlet **2**) and a second end with a fluid flow outlet (i.e., via centrally located outlet **9'**);
- the exhaust fluid (i.e., the dashed-arrows) flows through the inner concentric tube **8** in a direction substantially opposite to the intake fluid flow (i.e., the solid arrows) (see FIG. 2, which best illustrates the counter-current flow); and
- the heat exchanging arm being adapted to be attached to an exterior portion of the furnace (i.e., the axial center cavity **11** with heater structure **9**).

Regarding claims 2 and 9, Isenberg discloses rectangular channels (i.e., "two flat *rectangular channels* [**8**] allow counter flow heat exchange," column 6, lines 24-32).

Instant claims 1, 2, 8 and 9 structurally read on the apparatus of Isenberg.

6. Claims 1, 3-6, 8 and 10-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Grosseau (US 3,884,194).

Regarding claims 1 and 8, Grosseau (FIG. 1, 2) discloses an apparatus comprising:

- a heat generating furnace (internal combustion engine **M**);
- a heat exchanging arm (generator **1**) formed from an inner and an outer concentric tube (defined by half-shells **11/12** and **7/8**, respectively) and having an inner and outer passageway (duct **10** and exhaust pipe **9**, respectively) separated by a wall of the inner concentric tube;
- the inner concentric tube **11/12** having a first end with a fluid flow outlet (facing exhaust pipe **6**) and a second end with a fluid flow inlet (facing exhaust pipes **4/5** and cylinder head **2**);
- the outer concentric tube **7/8** having a first end with a fluid flow inlet (via pipe **14**) and a

second end with a fluid flow outlet (via pipe **15**);

– the fluid flow direction of the inner concentric tube **11/12** being substantially opposite the fluid flow direction of the outer concentric tube **7/8** (column 2, lines 45-51); and

– the heat exchanging arm **1** being adapted to be attached to an exterior portion of the furnace **M** (attached via exhaust pipes **4/5** to cylinder head **2**).

Regarding claims 3 and 10, Grosseau (FIG. 2; column 2, lines 9-23) discloses

– the inner concentric tube **11/12** is formed from a first **11** and a second **12** sheet, each having a first **11a/11b** and a second **12a/12b** edge;

– the outer concentric tube **7/8** is formed from a first **7** and a second **8** sheet, each having a first **7a/8a** and a second **7b/8b** edge; and

– the first edges **11a/11b/7a/8a** of the first and second sheets of the inner concentric tube **11/12** and the first and second sheets of the outer concentric tube **7/8** are crimped together (creating a common weld seam **13**), and the second edges **12a/12b/7b/8b** of the first and second sheets of the inner concentric tube **11/12** and the first and second sheets of the outer concentric tube **7/8** are crimped together (creating a common weld seam **13**), forming the channels **10/9**.

Regarding claims 4 and 11, Grosseau (FIG. 1, 2; column 2, lines 9-23) discloses the crimping (seams **13**) is in a direction substantially parallel to the fluid flow through the arm **1**.

Regarding claims 5, 6, 12 and 13, Grosseau disclose a plurality of arms (i.e., symmetrical generators **1** with respect to plane **P--P'**; column 1, line 65 to column 2, line 8; FIG. 1) with their respective second ends joined at a heat exchanger hub (cylinder head **2**), having an exhaust fluid intake shared by arms **1** (i.e., the exhaust from common internal combustion engine **M**).

Instant claims 1, 3-6, 8 and 10-13 structurally read on the apparatus of Grosseau.

7. Claims 1-6 and 8-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Weed et al. (US 4,215,742).

Regarding claims 1 and 8, Weed et al. (FIG. 7, 9; column 3, line 29 to column 4, line 6) disclose an apparatus comprising:

- a heat generating furnace (i.e., an internal combustion engine)
- at least one heat exchanging arm formed from an inner concentric tube (i.e., defined by U-shaped shells **114**) and an outer concentric tube (i.e., defined by U-shaped shells **111**) and having an inner passageway (i.e., comprising ***) and outer passageway (i.e., comprising passages **121**, **122**) separated by a wall of the inner concentric tube;
- the inner concentric tube **114** having a first end with a fluid flow outlet (i.e., via outlet **135**) and a second end with a fluid flow inlet (i.e., via inlet **130**);
- the outer concentric tube **111** having a first end with a fluid flow inlet (i.e., via inlet **123**) and a second end with a fluid flow outlet (i.e., via outlet **124**);
- the exhaust fluid flows through the inner concentric tube **114** in a direction substantially opposite to the intake fluid flow through the heat exchanger arm (i.e., see FIG. 7; counter-current flow as indicated by location of inlets **123/130** and outlets **124/235**); and
- the heat exchanging arm being adapted to be attached to an exterior portion of the furnace (i.e., "openings are preferably provided for fastening means for attaching the cooler to an exhaust manifold of an internal combustion engine," column 2, lines 2-5).

Regarding claims 2 and 9, Weed et al. disclose rectangular channels (see FIG. 9).

Regarding claims 3 and 10, Weed et al. (column 3, lines 31-40) disclose the inner concentric tube is formed from a first and a second sheet (i.e., first and second shells **114**) each

having a first and a second edge; the outer concentric tube is formed from a first and a second sheet (i.e., first and second shells **111**) each having a first and a second edge; and the first edges (i.e., the left edges) of the inner concentric tube **114** and the outer concentric tube **111** are crimped together, and the second edges (i.e., the right edges) of the inner concentric tube **114** and the outer concentric tube **111** are crimped together forming the channels (see FIG. 9).

Regarding claims 4 and 11, Weed et al. disclose the crimping is in a direction substantially parallel to the fluid flow through the arm (see FIG. 7, 9).

Regarding claims 5, 6, 12 and 13, Weed et al. disclose a plurality of arms (i.e., as defined by the two legs of the U-shaped shells) with their respective second ends joined at a heat exchanger hub (i.e., an exhaust manifold of an internal combustion engine; column 2, lines 2-5).

Instant claims 1-6 and 8-13 structurally read on the apparatus of Weed et al.

8. Claims 1, 5-8 and 12-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Gentry (US 3,706,445).

Regarding claims 1 and 8, Gentry (FIG. 8; generally, column 9, line 23 to column 10, line 8) discloses an apparatus comprising:

- a heat generating furnace (i.e., incinerator zone **227**);
- at least one heat exchanging arm formed from an inner concentric tube (i.e., incinerator tube comprising sections **240/244/246**) and an outer concentric tube (i.e., U-shaped outer tube **230**) and having an inner passageway (i.e., defined by tube **240/244/246**) and an outer passageway (i.e., defined by the annular passageway between tube **230** and tube **240/244/246**) separated by a wall of the inner concentric tube;
- the inner concentric tube **240/244/246** having a first end with a fluid flow outlet (i.e., via

exhaust conduit **250**) and a second end with a fluid flow inlet (i.e., via inlet **234**);

- the outer concentric tube **230** having a first end with a fluid flow inlet (i.e., via hole **231**) and a second end with a fluid flow outlet (i.e., via hole **233**);
- the exhaust fluid (i.e., indicated by dashed-arrows) flows through the inner concentric tube **240/244/246** in a direction substantially opposite to the intake fluid flow (i.e., indicated by solid arrows) through the heat exchanger arm; and
- the heat exchanging arm being adapted to be attached to an exterior portion of the furnace **227** (i.e., attachment to exterior portion defined by intake section **225**).

Regarding claims 5 and 12, Gentry (FIG. 8) discloses the heat exchanger has a plurality of arms (i.e., the two arms of the U-shaped tube, comprising the zones defined by first burner tube section **240** and straight upper section **246**) with their respective second ends joined at a heat exchanger hub (i.e., intake section **225**).

Regarding claims 6 and 13, Gentry (FIG. 8) discloses the heat exchanger hub (i.e., intake section **225**) has an exhaust fluid intake shared by the joined arms (i.e., intake via opening **220**).

Regarding claims 7 and 14, Gentry (FIG. 8) discloses one or more U-shaped arms (Abstract; lines 3-8) with respective second ends adapted to be inserted directly into furnace **214**.

Instant claims 1, 5-8 and 12-14 structurally read on the apparatus of Gentry.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 2 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grosseau (US 3,884,194).

Grousseau discloses the inner concentric tube **11/12** forms a rectangular channel (see FIG. 2) but is silent as to whether the outer concentric tube **7/8** may also form a rectangular channel. In any event, it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to select an appropriate channel shape, such as the recited rectangular channel shape, for the outer concentric tube in the apparatus of Grousseau, on the basis of suitability for the intended use and absent showing any unexpected results thereof, because it has been held that changes in shape involves only ordinary skill in the art. *In re Dailey* 149 USPQ 47, 50 (CCPA 1966); *Glue Co. v Upton* 97 US 3, 24 (USSC 1878).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is 703-305-4951. The examiner can normally be reached on 8:30 am - 5:30 pm M-F, every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on 703-308-6824. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Jennifer A. Leung
November 5, 2003

HIEN TRAN
PRIMARY EXAMINER